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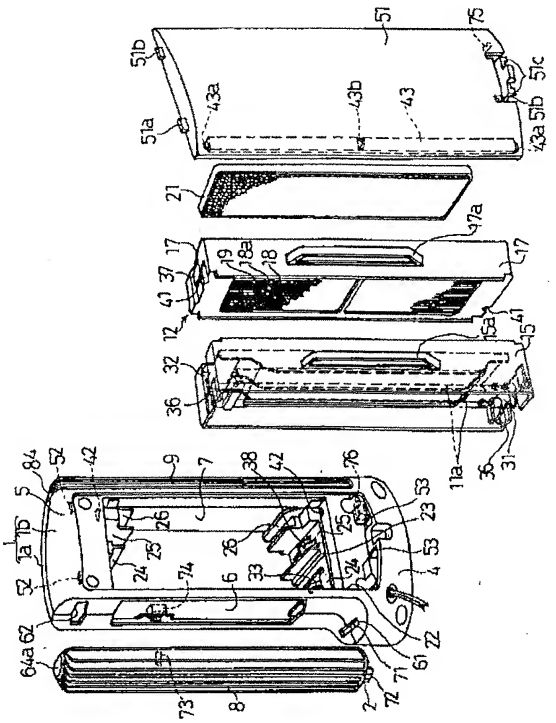
(54)【発明の名称】　空気清浄装置

(57)【要約】

【課題】　取り入れ口に設けられる通風パネルでも丸洗いにより清潔に保って、長期に見栄えよく使用し続けられるようにすることを目的とする。

【解決手段】　空気の取り入れ口６と出口７との間に、取り入れた空気中の塵埃を所定極性に帯電させる帯電手段１１、および帯電された塵埃を逆極性によって吸着する吸着電極１２を内蔵し、前記取り入れ口６と出口７とに設けられた通風パネル８、９のうち、少なくとも取り入れ口６側の通風パネル８を着脱できるように装着して、上記の目的を達成する。



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【特許請求の範囲】

【請求項１】　装置本体の空気の取り入れ口と出口との間に、取り入れた空気中の塵埃を所定極性に帯電させる帯電手段、および帯電された塵埃を逆極性によって吸着する吸着電極を内蔵した空気清浄装置において、
前記取り入れ口と出口とに設けられた通風パネルのうち、少なくとも取り入れ口側の通風パネルを着脱できるように装着したことを特徴とする空気清浄装置。

【請求項２】　通風パネルは、相対向する２辺の一方に外方に向け設けられた固定係合片を取り入れ口および出口の開口の対応する辺に設けられた係合孔に抜き差し自在に係合させ、かつ他方に設けられて外方に向け移動した係合位置にあるようにばねで付勢された可動係合片を前記開口の対応する辺に設けられた係合部に弾性係合させることにより着脱できるように装着される請求項１に記載の空気清浄装置。

【請求項３】　帯電手段および吸着電極の間に、帯電された塵埃をこれと逆の極性によって吸着電極の側に移行させて起風する起風電極が内蔵されている請求項１、２のいずれか一項に記載の空気清浄装置。

【請求項４】　取り入れ口および出口の間の各機器を、装置本体の取り入れ口および出口が設けられない側面から出し入れできるようにした請求項１～３のいずれか一項に記載の空気清浄装置。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、空気清浄装置に関し、詳しくは装置本体の空気の取り入れ口と出口との間に、取り入れた空気中の塵埃を所定電極に帯電させる帯電手段、および帯電された塵埃を逆極性によって吸着する吸着電極とを内蔵した各種の空気清浄装置に関するものである。

【０００２】

【従来の技術】この種の空気清浄装置では、装置本体内に内蔵している帯電手段や吸着電極、フィルタ等は、空気清浄装置が使用される都度、空気中の塵埃と接触して、あるいはそれを吸着し、また捕捉することによって汚れ、これが次第に堆積する。

【０００３】これに対処するのに従来、帯電手段や吸着電極、およびフィルタ等は着脱できるようにしている。これにより、帯電手段や吸着電極、およびフィルタ等をそれらの汚れ度合いに応じて取出し電源から分離した状態で丸洗いすることができる。

【０００４】一方、装置本体の空気の取り入れ口および出口には、手指の挿入や異常な大きさの異物の混入を防止する程度の粗い各種形状の格子目を持つ等した各種通風パネルが設けられる。

【０００５】

【発明が解決しようとする課題】このような通風パネルは汚れにくく空気清浄装置の性能にも影響しないので、

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一般に装置本体に固定的に設けられる。静電方式により起風して、ファンなしで空気を取り入れ口から取り入れて清浄化処理をし、処理後の清浄な空気を出口から送り出すようにしたタイプの空気清浄装置では特に、空気の流れが極く緩やかで通風パネルがさらに汚れにくい。

【０００６】しかし、ファンによって空気を取り入れ、出すタイプのものでは勿論、静電起風タイプのものでも、清浄処理していない空気が通る取り入れ口に設けられる通風パネルは特に、空気中の塵埃が多い環境であったり、空気清浄装置の使用の延べ時間が長くなったりすると汚れが生じることがある。また、長く据え置くだけでもまわりの空気中の塵埃が付着し汚れることがある。

【０００７】通風パネルの汚れは各種格子目の隅角部に付着して堆積しやすく、一旦汚れが付くと外から叩いたりしても除去し切れない。また、汚れを拭いとるにも各種格子目の隅角部には及びにくく作業が困難である。これらによって、長期使用の間に見栄えが徐々に低下し、終には使用しなくなると云ったことにもなる。

【０００８】本発明の目的は、取り入れ口に設けられる通風パネルでも丸洗いにより清潔に保って、長期に見栄えよく使用し続けられる空気清浄装置を提供することにある。

【０００９】

【課題を解決するための手段】本発明の空気清浄装置は、装置本体の空気の取り入れ口と出口との間に、取り入れた空気中の塵埃を所定極性に帯電させる帯電手段、および帯電された塵埃を逆極性によって吸着する吸着電極を内蔵していて、装置本体の取り入れ口から入って出口へと抜ける空気中の塵埃を帯電手段により所定極性に帯電させ、この帯電後の塵埃を、それとは逆極性の吸着電極によって吸着して前記空気中から除去するので、出口へ抜ける空気を清浄空気とすることができる。

【００１０】本発明は特に、前記取り入れ口と出口とに設けられた通風パネルのうち、少なくとも取り入れ口側の通風パネルを着脱できるように装着したことを特徴とするものである。

【００１１】このような構成では、上記ファンにより空気を取り入れ送り出すタイプのものか、請求項３の発明の構成による静電方式により起風するタイプのものかを問わず、使用の延べ時間によっては汚れることのある、少なくとも取り入れ口側に設けられる通風パネルを、例えば請求項２の発明のようにして着脱できるようにすることで、電源と切り離して丸洗いすることができるので、これを清潔に保つことができ、空気清浄装置を寿命一杯まで長期に見栄えよく使用し続けることができる。

【００１２】請求項２の発明では、通風パネルが、相対向する２辺の一方に外方に向け設けられた固定係合片を取り入れ口および出口の開口の対応する辺に設けられた係合孔に抜き差し自在に係合させ、かつ他方に設けられて外方に向け移動した可動係合位置にあるようにばねで

付勢された係合片を前記開口の対応する辺に設けられた係合部に弾性係合させることにより着脱できるように装着される。

【００１３】このような構成では、通風パネルの相対向する２辺の一方の外方に向く固定係合片を取り入れ口および出口の対応する辺に設けられた係合孔に差し込んで係合させる通風パネルの全体をその面方向に移動させる作業と、これに続いて行える他方の辺の外方に向く可動係合片を前記開口の対応する辺に設けられた係合部に弾性係合させる通風パネルをその面と直角な方向に可動係合片側で移動させる作業とで、通風パネルを外れ止め状態に簡易に装着して、使用状態とすることができるし、前記可動係合片の係合部との弾性係合を解くだけで通風パネルを面方向に移動させて固定係合片を係合孔から抜き出し係合を解いて、通風パネルを簡易に取り外せるので、通風パネルを丸洗いしながわ繰り返し使用するのに便利である。

【００１４】請求項４の発明では、取り入れ口および出口の間の各機器を、装置本体の取り入れ口および出口が設けられない側面から出し入れできる。

【００１５】このような構成では、装置本体の側面は前記各機器が並ぶ方向と平行であって、取り入れ口および出口とそれらに設けられる通風パネルとの存在に影響なく、それら機器の全てを露出させる開口を持ち得るので、このような開口を通じて、各機器を汚れ度合いの違い等に応じた必要単位で、必要の都度、それぞれ個別に取出して電源と切り離した状態で丸洗い等し、また装着することができ、それら機器の汚れによる性能の低下を、過剰な取扱いなく防止しながら空気清浄装置を長期に使用し続けられる。

【００１６】

【発明の実施の形態】以下、本発明の空気清浄装置の代表的な実施の形態について添付の図に基づいて説明する。

【００１７】本実施の形態の空気清浄装置は、静電方式により起風して空気を取り込み清浄化して送り出す空気清浄器の場合の一例を示している。図２、図３、図６、図７に示すように横断面形状が楕円形となる胴部形状を有した装置本体１が、合成樹脂材料により型成形して形成された、正面壁１ａおよび背面壁１ｂを最中合わせにしてねじ２により結合することにより構成されている。装置本体１の下部は図１に示すような駆動および各種制御を行う回路構成部３を収容し、かつ装置本体１を安定に定置する中空の基台４とされ、上部は中空の頭部５とされ、前記ねじ２による結合がこれら中空の頭部５と基台４との中に設けられたボス１ａ１、１ｂ１どうしをねじ２により、例えば図３に示すように締結することで行っている。

【００１８】装置本体１の胴部の左右には、図１、図３に示すように空気の取り入れ口６と出口７とが設けられ、これらの開口には合成樹脂材料で単独に型成形した通風パネル８、９が装着されている。これら通風パネル８、９は図１～図８に示すような角形の粗い格子目を持ったものとし、通過する空気に抵抗を与えず、しかも、手指が入って高圧部に触れたりする危険を防止でき、また、小さな紙屑、樹脂片、樹脂製品、金属片、金属製品等が入り込んで火災や漏電の原因になったりするのを防止できるようにしている。これらを満足するものであれば、具体的な形態は自由である。また、それら通風パネル８、９の縦向きの羽根は空気の流れ方向に沿った大きな幅を有したものとして、いわゆるルーバータイプの整流作用を取り入れられ、送り出される空気に及ぼすようにしてある。

【００１９】本実施の形態では、上記装置本体１の横断面が楕円である胴部がなす長径方向に長いスペースを利用して、図１、図３に示すように装置本体１の空気の取り入れ口６と出口７との間に、取り入れた空気中の塵埃を所定極性例えばプラスに帯電させる帯電手段１１、および帯電された塵埃をそれと逆極性例えばマイナス極性によって吸着する吸着電極１２とを内蔵してあり、装置本体１の取り入れ口６から入って出口７へと抜ける空気中の塵埃を帯電手段１１によりプラス極性に帯電させ、この帯電後の塵埃を、それとは逆のマイナス極性の吸着電極１２によって吸着して前記空気中から除去するので、出口７へ抜ける空気を清浄空気とすることができる。同時に、空気中にマイナスイオンが発生してこれら清浄空気とともに出ていくので、生態によい住環境をもたらす。

【００２０】本実施の形態ではさらに、図１、図３に示すように前記装置本体１の胴部内のスペースの長径方向に長いのを利用して、帯電手段１１および吸着電極１２の間に、帯電された塵埃をこれと逆のマイナス極性によって吸着電極１２の側に移行させて起風する起風電極１３を内蔵している。これにより、本実施の形態での空気清浄器はファンおよびこれを駆動するモータが不要で、構成が簡単で軽量かつ安価なものになるし、ファンやモータが回転することによる音がなく運転が静かである。しかし、通風パネル８、９はできるだけ通風抵抗の小さなものが望まれる。

【００２１】帯電手段１１および起風電極１３は起風手段１４を構成し、１つの合成樹脂製の矩形枠１５に装備したユニットに形成され、このユニット単位で他から独立して装置本体１に着脱できるようにされている。帯電手段１１は高圧電圧を印加される細いワイヤ１１ａよりなり、これを例えば逆Ｕ字状に矩形枠１５の取り入れ口６側部分内に張設されている。しかし、ワイヤ１１ａの張設形態は種々に設計することができる。また、起風電極１３は図１、図３に示すように、ワイヤ１１ａと交互位置になるように、矩形枠１５の出口７側部分内にその内側面近傍位置と中央位置とに電極板部１６ａが位置し

て、これの幅方向が空気通過方向に向くようにした１つの金属板部材１６で形成されている。しかし、これらの具体的構成は空気清浄装置としての機能を損なわない限り種々に設計されてよく、帯電手段１１と起風電極１４とを個別に着脱できるようにすることもできる。

【００２２】吸着電極１２は図２、図３に示すように、合成樹脂製の矩形枠１７内に空気の通過方向に平行な金属製で多数の電極板１８がそれ自体に設けられた折曲げスペーサ部１８ａ間を合成樹脂製のシート１９で絶縁されて配置された構造のものとされ、これ単独で装置本体１に対し着脱できるようにしてある。しかし、これも通過する空気中の塵埃を逆極性によって効率よく確実に吸着できれば好適で、そのために種々な具体的構成を採ることができる。

【００２３】また、出口７と吸着電極１２との間には網の目状に成形された活性炭等を用いたフィルタ２１が設けられ、これも単独で装置本体１に対し着脱できるようにしてある。したがって、これら帯電手段１１および起風電極１３を持った起風手段１４、吸着電極１２、フィルタ２１のそれぞれがその汚れに応じて個別に引出し、電源から分離した状態で丸洗いしながら繰り返し利用され、空気清浄器が性能低下せずに長期に使用されるようにすることが、それぞれの過剰な取扱いなく達成することができる。

【００２４】ファンによる起風方式では取り入れ口６にもフィルタを設けるのが好適であるが、本実施の形態のような静電起風方式では通風抵抗をできるだけ抑える意味からフィルタを採用しないのが有利ではある。しかし、これに限られることはなくフィルタを採用することもできる。

【００２５】本実施の形態の空気清浄器のように、静電方式により起風して、ファンなしで空気を取り入れ口６から取り入れて清浄化処理をし、処理後の清浄な空気を出口７から送り出すようにしたタイプの空気清浄装置では特に、空気の流れが極く緩やかで通風パネルがさらに汚れにくいが、清浄処理していない空気が通る取り入れ口６に設けられる通風パネル８は特に、空気中の塵埃が多い環境であったり、空気清浄器の使用の延べ時間が長くなったりすると汚れが生じることがある。

【００２６】これに対処するのに本実施の形態では、取り入れ口６に設けられる通風パネル８を装置本体１に対し着脱できるようにしてある。これにより、この通風パネル８を汚れ具合に合わせて取外し、電源と切り離して丸洗いすることにより、これを清潔に保つことができ、空気清浄装置を寿命一杯まで長期に見栄えよく使用し続けることができる。

【００２７】装置本体１は、起風手段１４、吸着電極１２、フィルタ２１のそれぞれを単独で着脱するのに、取り入れ口６および出口７が設けられない側面を形成する背面壁１ｂにそれらの一面側の全体をを外部に露出させる大きさの図３、図６、図８に示すような着脱口２２が形成され、この着脱口２２と正面壁１ａとの間にそれら起風手段１４、吸着電極１２、フィルタ２１を収容するポケットを形成する単体または適数の合成樹脂部材の組み合わせにより形成されたポケット部材２３が、図３に一部を代表して示すように挟み込まれ、前記ボス１ａ１、１ｂ１間で締結固定されている。このポケット部材２３の底部壁と天井壁とに、図１、図２に示すような起風手段１４用のガイド溝２４、吸着電極１２用のガイド溝２５、およびフィルタ２１用のガイド溝２６がそれぞれ、それら各ガイド溝２４～２６に沿って着脱口２２の側から個別に着脱できるようにしてある。

【００２８】起風手段１４、吸着電極１２、フィルタ２１のそれぞれは、図１～図３に示すように異なった幅を有し、起風手段１４および吸着電極１２と、フィルタ２１とは高さが異なっており、それらに合わせて設けられたガイド溝２４～２６の幅および上下間隔の違いによって、起風手段１４、吸着電極１２、フィルタ２１のそれぞれが、不適正な位置に挿入しようとしても挿入できないか、挿入できてもガタツキが生じて、不適正な装着であることが分かり、使用上そのような誤装着が生じるようなことを防止できる。

【００２９】図２、図９の（ａ）に示すように、起風手段１４の矩形枠１５の下面には帯電手段１１のワイヤ１１ａと接続されてそれに電荷を印加する電極３１が露出し、上面には起風電極１３と接続されてそれに電荷を印加する電極３２が露出し、上下両面には上下のガイド溝２４の所定位置に挿入されて、そこに図２、図９の（ａ）、（ｂ）に示すように突出している電源側の電荷印加電極３３、３４と適正に接触したとき、前記上下のガイド溝２４に一体成形して設けられた図９の（ａ）、（ｂ）に示すような樹脂ばね係合片３５と弾性係合して係止する係合凹部３６が設けられ、起風手段１４は前記挿入位置に弾性的に係止されると、この弾性係止力に抗して取り出せなくなり、起風手段１４が不用意に取り出されたり、適正位置から位置ずれして動作不良や危険な状態に至るようなことを防止することができる。

【００３０】図２、図１０に示すように、吸着電極１２の矩形枠１７の上下面には電極板１８に接続された電圧を印加する電極３７が露出し、かつ、矩形枠１７が上下のガイド溝２５の所定位置に挿入されて、そこに突出している電源側の電荷印加電極３８と適正に接触したとき、前記上下のガイド溝２５に一体成形して設けられた樹脂ばね係合片３９と弾性係合して係止する係合凹部４１が設けられ、吸着電極１２は前記挿入位置に弾性的に係止されると、この弾性係止力に抗してしか取り出せなくなり、吸着電極１２が不用意に取り出されたり、適正位置から位置ずれして動作不良や危険な状態に至るようなことを防止することができる。

【００３１】フィルタ２１はこれをガイド溝２６に適正

位置まで挿入された位置の直ぐ手前の位置で、ガイド溝２６からガイド溝２４、２５とほぼ同一レベルになるように段差を有した面に設けられた図２に示すような係合溝４２に上下端の係合片４３ａを自身の弾性変形を利用し弾性的に嵌め合わせた合成樹脂製のカバー部材４３によって抜け止めし、不用意な取外しや位置ずれを防止できるようにしてある。

【００３２】このカバー部材４３を弾性変形させて取り外すことによりフィルタ２１を引き出せる。

【００３３】矩形枠１５、１７、およびカバー部材４３の着脱を行う外面には、それぞれ着脱操作用のつまみ１５ａ、１７ａ、４３ｂが設けられ、本実施の形態ではそれらは一体成形して設けられている。

【００３４】着脱口２２には図２、図３に示すような合成樹脂製の蓋体５１が着脱できるように装着され、蓋体５１を取り外すことによって起風手段１４、吸着電極１２、およびフィルタ２１を必要に応じて着脱できる。この着脱構造は本実施の形態の場合、図２に示すように相対向する２辺、本実施の形態では上下の辺の一方、上辺に外方となる上向きに一体成形して設けられた固定係合片５１ａを、着脱口２２の対応する上辺に設けられた係合孔５２に抜き差し自在に係合させ、かつ他方である下辺に設けられて外方に向け移動した係合位置にあるように樹脂ばね部５１ｂで付勢された可動係合片５１ｃを前記着脱口２２の対応する下辺に設けられた係合部５３に弾性係合させることにより着脱できるように装着している。

【００３５】これにより、蓋体５１は固定係合片５１ａを着脱口２２の対応する上辺の係合孔５２に差し込んで係合させる蓋体５１の全体をその面方向に移動させる作業と、これに続いて行える他方の下辺の外方に向く可動係合片５１ｃを前記着脱口２２の対応する下辺に設けられた係合部５３に弾性係合させる蓋体５１をその面と直角な方向に可動係合片５１ｃ側で移動させる作業とで、蓋体５１を外れ止め状態に簡易に装着して、使用状態とすることができる。また、前記可動係合片５１ｃの係合部５３との弾性係合を解くだけで蓋体５１を面方向に移動させて固定係合片５１ａを係合孔５２から抜き出し係合を解いて、蓋体５１を簡易に取り外せる。

【００３６】前記取り入れ口６の通風パネル８を着脱する構造は、図１、図２、図４に示すように通風パネル８の、相対向する２辺の一方である下辺に外方である下向きに一体成形して設けられた固定係合片８ａを取り入れ口６の開口の対応する下辺に設けられた係合孔６１に抜き差し自在に係合させ、かつ他方である上辺に設けられて外方である下向きに移動した可動係合位置にあるようにコイルばね６３で付勢された図１１、図１２に示すような可動係合片６４を前記開口の対応する上辺に設けられた係合部６２に弾性係合させることにより着脱できるように装着される。可動係合片６４は押圧操作部６４ａが通風パネル８の上面に押圧操作されるように露出している。６４ｂは通風パネル８からの抜け止め用の係合片を示し、通風パネル８の係合孔６５と係合している。

【００３７】通風パネル８の相対向する２辺の下辺の下向きの固定係合片８ａを取り入れ口６の対応する下辺に設けられた係合孔６１に差し込んで係合させる通風パネル８の全体をその面方向に移動させる作業と、これに続いて行える他方の上辺の上向きの可動係合片６４を取り入れ口６の対応する上辺に設けられた係合部６２に弾性係合させる通風パネル８をその面と直角な方向に可動係合片６４側で移動させる作業とで、通風パネル８を外れ止め状態に簡易に装着して、使用状態とすることができる。また、前記可動係合片６４の係合部６２との弾性係合を押圧操作部６４ａを押圧操作して解くだけで通風パネル８を面方向に移動させて固定係合片８ａを係合孔６１から抜き出し係合を解いて、通風パネル８を簡易に取り外せるので、通風パネル８を丸洗いしながら繰り返し使用するのに便利である。

【００３８】通風パネル８および蓋体５１の一方でも外れた状態で、あるいは外れかけた状態で空気清浄器が使用されると、危険である。これに対処するのに本実施の形態では、図１、図２に示すように通風パネル８の場合、それに一体成形した固定係合片８ａが係合孔６１に係合することにより、装置本体１側のスイッチ７１を突起７２の金属面によって押動し、可動係合片６４が係合部６２に係合することによって一体成形された樹脂製の突起７３が装置本体１側のスイッチ７４を押動する双方の一方でも満足していないと電源からの給電を絶つようにしてある。また、蓋体５１のそれに一体成形した可動係合片５１ｃが係合部５３に係合するときに突起７５が装置本体１側のスイッチ７６を押動することを満足しないと、電源からの給電を絶つようにしてある。従って、起風手段１４、吸着電極１２が装着されていても、通風パネル８および蓋体５１の双方が正しく装着されていないと、動作しないので、使用の安全が確保される。

【００３９】本実施の形態では出口７に設けられた通風パネル９も、取り入れ口６に設けた前記通風パネル８と同じ形状、同じ構造のものを採用し、可動係合片６４に変えて嵌めごろしの固定係合片８４を用いて通風パネル９を固定している。これにより固定の通風パネル９を設けるにも別の通風パネル９を形成する必要がなく、コスト上昇を抑えられる。

【００４０】なお、出口７の通風パネル９をも着脱できるようにすると、これも電源から切り離して丸洗いでき、便利である。この場合、通風パネル８と同じ着脱構造および安全構造を採用すればよい。また、図５に示す８１は電源スイッチ、８２は運転ランプ、８３は点検ランプをそれぞれ示し、点検ランプは汚れ等による性能低下時に点検を促すものである。

【００４１】

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【発明の効果】本発明の空気清浄装置によれば、特に、上記ファンにより空気を取り入れ送り出すタイプのものか、請求項３の発明の構成による静電方式により起風するタイプのものかを問わず、使用の延べ時間によっては汚れることのある、少なくとも取り入れ口側に設けられる通風パネルを、例えば請求項２の発明のようにして着脱できるようにすることで、電源と切り離して丸洗いすることができるので、これを清潔に保つことができ、空気清浄装置を寿命一杯まで長期に見栄えよく使用し続けることができる。

【００４２】請求項２の発明では、通風パネルの相対向する２辺の一方の外方に向く固定係合片を取り入れ口および出口の対応する辺に設けられた係合孔に差し込んで係合させる通風パネルの全体をその面方向に移動させる作業と、これに続いて行える他方の辺の外方に向く可動係合片を前記開口の対応する辺に設けられた係合部に弾性係合させる通風パネルをその面と直角な方向に可動係合片側で移動させる作業とで、通風パネルを外れ止め状態に簡易に装着して、使用状態とすることができるし、前記可動係合片の係合部との弾性係合を解くだけで通風パネルを面方向に移動させて固定係合片を係合孔から抜き出し係合を解いて、通風パネルを簡易に取り外せるので、通風パネルを丸洗いしながら繰り返し使用するのに便利である。

【００４３】請求項４の発明によれば、装置本体の側面は前記各機器が並ぶ方向に平行であって、取り入れ口および出口とそれらに設けられる通風パネルとの存在に影響なく、それら機器の全てを露出させる開口を持ち得るので、このような開口を通じて、各機器を汚れの度合いの違い等に対応した必要単位で、必要の都度それぞれ個別に取出して電源と切り離した状態で丸洗い等し、また装着することができ、それら機器の汚れによる性能の低下を、過剰な取扱いなく防止しながら空気清浄装置を長期に使用し続けられる。

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＊【図面の簡単な説明】

【図１】本発明の代表的な実施の形態の空気清浄装置を示す縦断背面図である。

【図２】図１の装置の分解斜視図である。

【図３】図１の装置の横断平面図である。

【図４】図１の装置の取り入れ口に設けられた通風パネルの斜視図である。

【図５】図１の装置の正面図である。

【図６】図１の装置の取り入れ口側の側面図である。

【図７】図１の装置の平面図である。

【図８】図１の装置の蓋板を外して見た背面図である。

【図９】図１の装置の起風手段取付け部を示し、その（ａ）は断面図、その（ｂ）は底部の斜視図である。

【図１０】図１の装置の吸着電極の取付け部を示す断面図である。

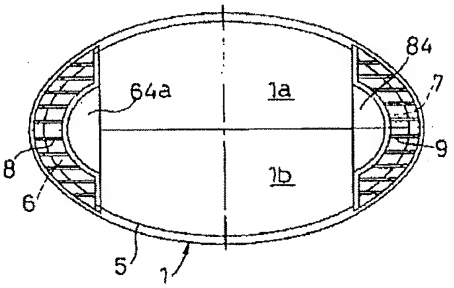
【図１１】図４の通風パネルの可動係合片が設けられる上端部の分解斜視図である。

【図１２】図１１の横断平面図である。

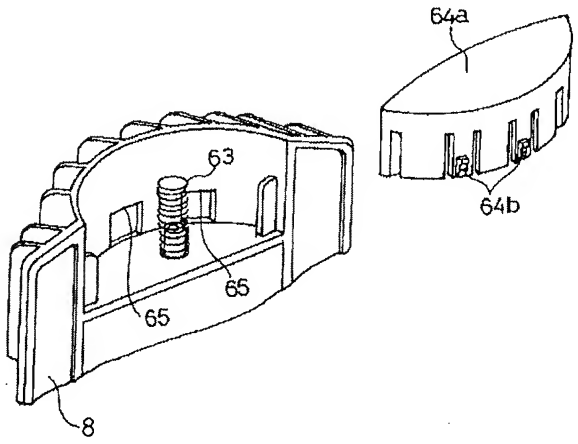
【符号の説明】

１　装置本体
６　取り入れ口
７　出口
８、９　通風パネル
８ａ　固定係合片
１１　帯電手段
１２　吸着電極
１３　起風電極
１４　起風手段
６１　係合孔
６２　係合部
６３　コイルばね
６４　可動係合片
６４ａ　押圧操作部

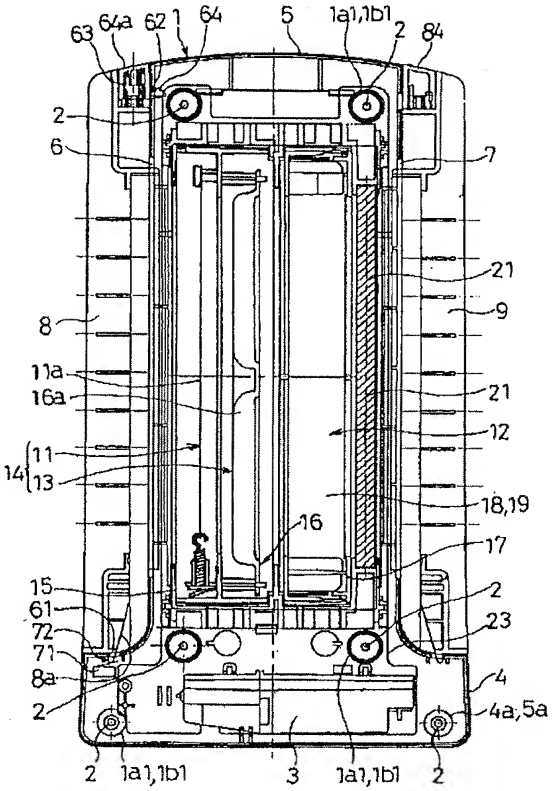
【図７】



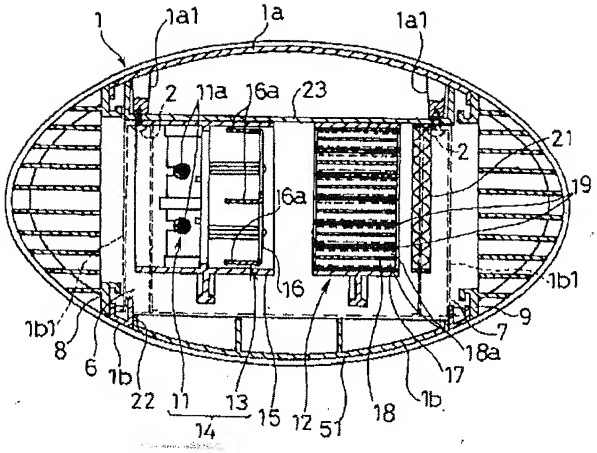
【図１１】



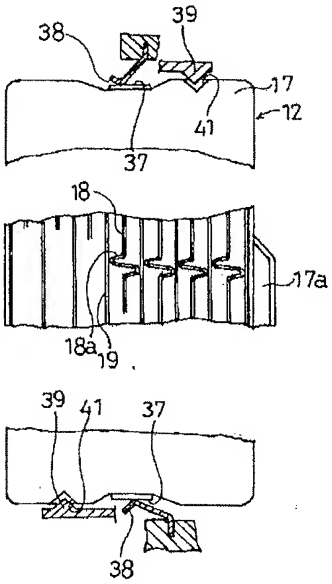
【図１】



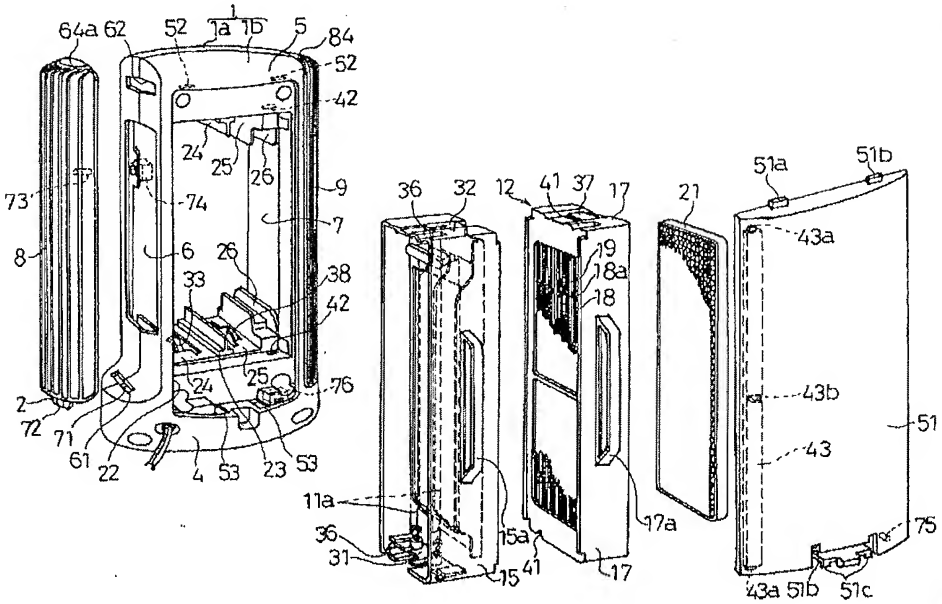
【図３】



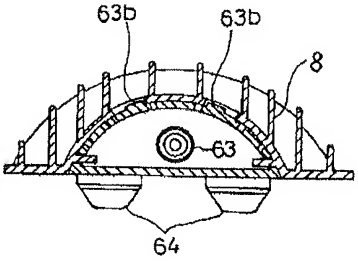
【図１０】



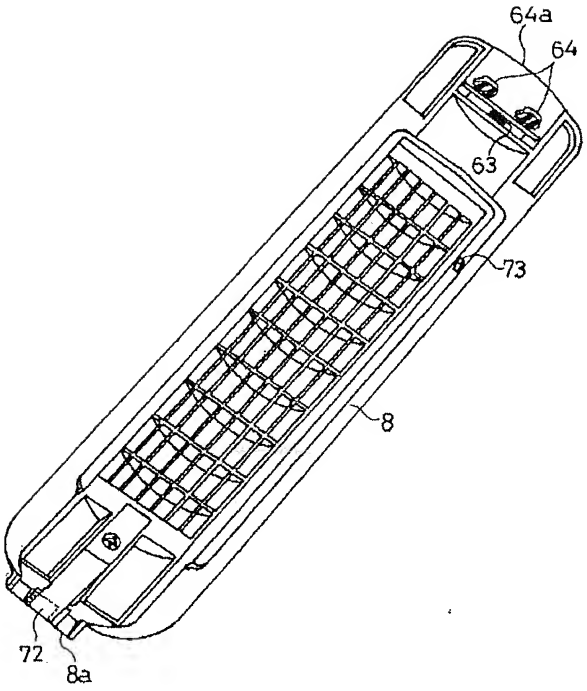
【図２】



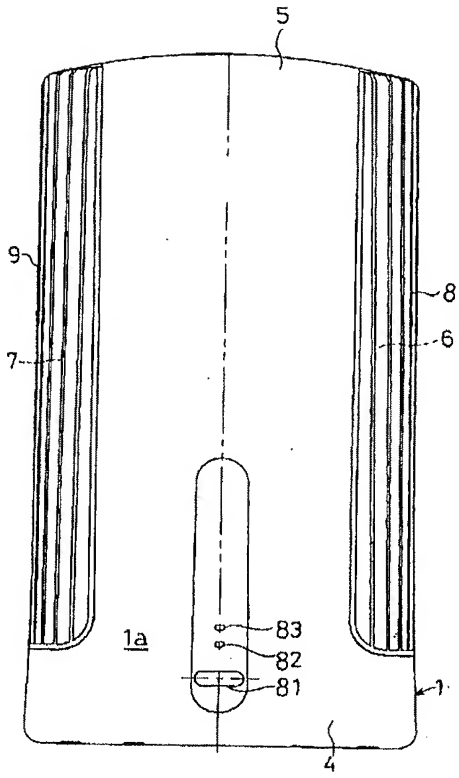
【図１２】



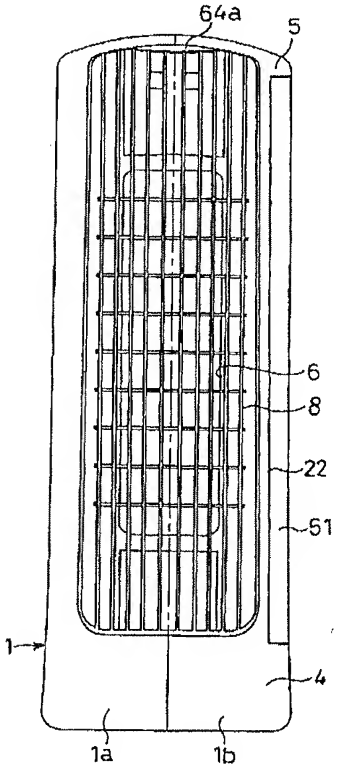
【図４】


64a
64
63
73
8
72
8a

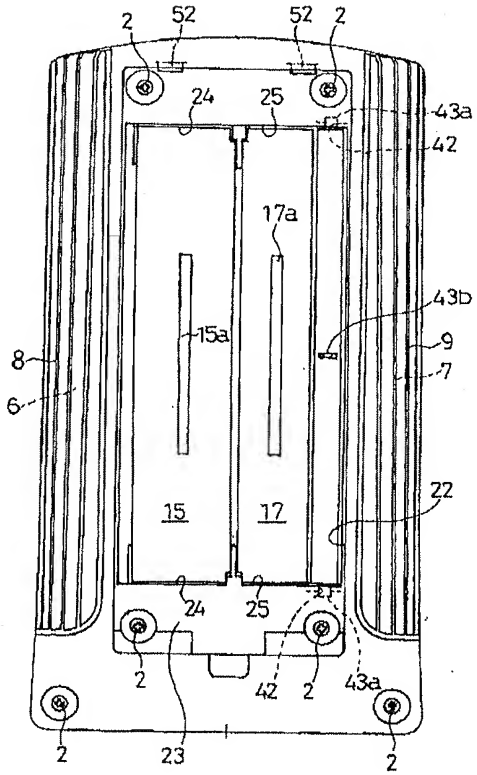
【図５】


5
9
8
7
6
1a
83
82
81
1
4

【図６】


64a
5
6
8
22
51
1
4
1a
1b

【図８】


2
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43a
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17a
43b
15a
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6
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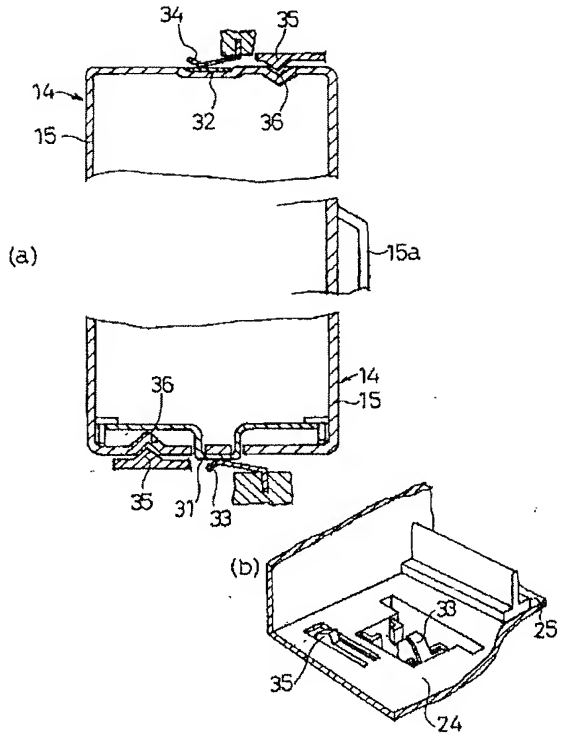
25
2
42
2
43a
2
23
2

【図９】



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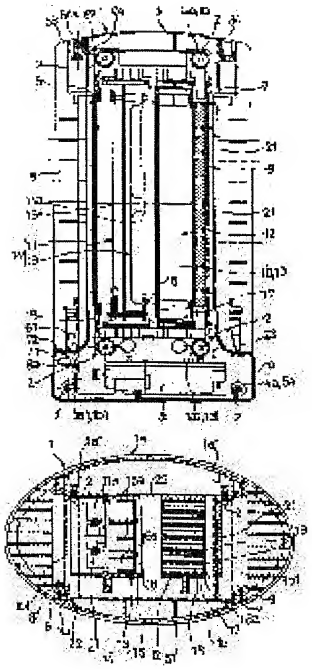
(54) AIR CLEANER

(57)Abstract:
PROBLEM TO BE SOLVED: To continue to use an air cleaner in a nice-looking manner for long period of time by keeping clean even an air ventilation panel to be provided to an intake by washing whole.
SOLUTION: A charge means 11 wherein dust taken in air is charged to a specific polarity, and an attractive electrode 12 attracting the charged dust with a reverse polarity are built-in between an intake 6 of air and its outlet 7, and at least an air ventilation panel 8 of the intake 6 side in the air ventilation panels 8, 9 provided to the intake 6 and the outlet 7 is so installed as to be capable of being detached.



* NOTICES *

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CLAIMS

[Claim(s)]
[Claim 1]In an air cleaner which contained an electrifying means which electrifies dust in the taken-in air in prescribed polarity, and an adsorption electrode which adsorbs electrified dust with reverse polarity between an intake of air of a device main frame, and an exit, An air cleaner equipping so that ventilation panels by the side of an intake can be detached and attached at least among ventilation panels provided in said intake and an exit.
[Claim 2]Ventilation panels make a fixed engagement piece provided in one side of two sides which carries out for relativity towards a method of outside engage with an engagement hole established in a neighborhood to which an intake and an opening of an exit are equivalent, enabling free extraction and insertion, And the air cleaner according to claim 1 with which it is equipped so that it can detach and attach by making an engagement part provided in a neighborhood to which said opening is equivalent carry out elastic engagement of the movable engaging piece energized by means of a spring as it was in an engagement position which it was provided in another side and moved towards a method of outside.
[Claim 3]An air cleaner given in any 1 paragraph of claims 1 and 2 in which a starting blow electrode which makes electrified dust shift to the adsorption electrode side, and carries out a starting blow with polarity contrary to this between an electrifying means and an adsorption electrode is built.
[Claim 4]The air cleaner according to any one of claims 1 to 3 which enabled it to take each apparatus between an intake and an exit in and out of the side in which it is not provided in an intake and an exit of a device main frame.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to various kinds of air cleaners which contained the electrifying means which electrifies the dust in the air taken in between the intake of the air of a device main frame, and the exit in a predetermined electrode, and the adsorption electrode which adsorbs the electrified dust with reverse polarity in detail about an air cleaner.
[0002]
[Description of the Prior Art]In this kind of air cleaner, whenever an air cleaner is used, an electrifying means, an adsorption electrode, a filter which are built in in a device main frame contact the dust in the air, or become dirty by adsorbing it and catching it, and this deposits them gradually.
[0003]Although this is coped with, it enables it to detach and attach an electrifying means, an adsorption electrode, a filter, etc. conventionally. It can wash whole in the state where took out the electrifying means, an adsorption electrode, a filter, etc. according to those soiling degrees, and it dissociated from the power supply by this.
[0004]On the other hand, various ventilation panels with the lattice eye of the various coarse shape of a grade of preventing insertion of fingers and mixing of the foreign matter of an unusual size are provided in the intake and exit of air of a device main frame.
[0005]
[Problem(s) to be Solved by the Invention]Since such ventilation panels do not influence the performance of an air cleaner that it is hard to become dirty, either, generally it is provided in a device main frame fixed. the air cleaner of the type which carries out a starting blow with an electrostatic method, takes in air without a fan from an intake, carries out cleaning processing, and sent out the pure air after processing from the exit -- especially -- the flow of air -- **** -- it is loose and ventilation panels do not become dirty further easily.
[0006]However, with a fan, take in air and by the thing of the type to take out, of course, When it is environment with much dust in the air or the manhour of use of an air cleaner becomes long especially, dirt may produce the ventilation panels provided in the intake along which the air an electrostatic starting blow type thing has not carried out [air] pure processing, either passes. The dust in the surrounding air may adhere and keeping unchanged for a long time may also become dirty.
[0007]The dirt of ventilation panels adheres to the corner of various lattice eyes, and it is easy to deposit it, and once dirt is attached, even if it will strike from outside, it removes and it does not go out. Work is [that it is hard to reach the corner of various lattice eyes wiping dirt] difficult. It also means having said that appearance fell gradually between long-term use, and it stopped ******(ing) at last by these.
[0008]The purpose of this invention is to also keep clean the ventilation panels provided in an intake by washing whole, and to provide the air cleaner which often continues being used for a long period of time.

[0009]
[Means for Solving the Problem]An air cleaner of this invention between an intake of air of a device main frame, and an exit, An electrifying means which electrifies dust in the taken-in air in prescribed polarity, and an adsorption electrode which adsorbs electrified dust with reverse polarity are built in, Since dust in the air which enters from an intake of a device main frame and from which it escapes to an exit is electrified in prescribed polarity by an electrifying means, it adsorbs dust after this electrification by an adsorption electrode of reverse polarity and it removes out of said air, air from

which it escapes to an exit can be made into clean air.
[0010]It equipped especially with this invention so that ventilation panels by the side of an intake could be detached and attached at least among ventilation panels provided in said intake and an exit.
[0011]In a thing of a type which takes in air with the above-mentioned fan and is sent out in such composition. Regardless of a type which carries out a starting blow with an electrostatic method by composition of an invention of claim 3, It is carrying out ventilation panels which have become dirty depending on a manhour of use and which are provided in the intake side at least, for example like an invention of claim 2, and enabling it to detach and attach them, this can be kept clean and using an air cleaner for a until [life full] long period of time, since it can separate from a power supply and can wash whole can be continued well
[0012]A fixed engagement piece in which ventilation panels were provided in one side of two sides which carries out for relativity towards a method of outside is made to engage with an engagement hole established in a neighborhood to which an intake and an opening of an exit are equivalent in an invention of claim 2, enabling free extraction and insertion, And it is equipped so that it can detach and attach by making an engagement part provided in a neighborhood to which said opening is equivalent carry out elastic engagement of the engagement piece energized by means of a spring as it was in a movable engagement position which it was provided in another side and moved towards a method of outside.
[0013]Work which moves the whole ventilation panels which make a fixed engagement piece which turns to a way in such composition outside [one / in which ventilation panels carry out for relativity] two sides insert and engage with an engagement hole established in a neighborhood whose intake and exit correspond to the plane direction, By the field and work moved in the right-angled direction by the movable engaging piece side, ventilation panels which make an engagement part provided in a neighborhood to which said opening is equivalent carry out elastic engagement of the movable engaging piece which turns to a way outside a neighborhood of another side which can be performed following this. Can equip a state simply stop separating from ventilation panels, can consider it as condition of use, and, Since ventilation panels are moved to a plane direction only by solving elastic engagement to an engagement part of said movable engaging piece, a fixed engagement piece is extracted from an engagement hole, engagement is solved and ventilation panels can be removed simply, it is convenient to wash whole and carry out ****** repeated use of the ventilation panels.
[0014]In an invention of claim 4, each apparatus between an intake and an exit can be taken in and out of the side in which it is not provided in an intake and an exit of a device main frame.
[0015]Since it can have an opening to which all these apparatus is exposed in such composition the side of a device main frame is parallel to a direction with which said each apparatus is located in a line, and uninfluential in existence with an intake and an exit, and ventilation panels provided in them, Each apparatus in a required unit according to a difference in a soiling degree, etc. through such an opening. It can wash whole and equip in the state where took out individually, respectively and it separated from a power supply at every necessity, and using an air cleaner for a long period of time is continued, preventing a fall of performance by dirt of these apparatus without superfluous handling.
[0016]
[Embodiment of the Invention]Hereafter, the typical embodiment of the air cleaner of this invention is described based on attached figures.
[0017]The starting blow of the air cleaner of this embodiment is carried out with an electrostatic method, and it shows an example in the case of the air purifier which incorporates, defecates and sends out air. drawing 2 -- drawing 3 -- drawing 6 -- drawing 7 -- being shown -- as -- lateral cross sectional shape -- an ellipse -- type -- becoming -- a drum section -- shape -- having had -- a device main frame -- one -- a synthetic resin material -- die forming -- carrying out -- forming -- having had -- a front wall -- one -- a -- and -- a rear side wall -- one -- b -- the midst -- doubling -- carrying out -- ****ing -- two -- joining together -- things -- constituting -- having -- **** . The lower part of the device main frame 1 accommodates the circuitry part 3 which performs a drive and various control as shown in drawing 1, And it is considered as the pedestal 4 of the hollow which fixes the device main frame 1 stably, the upper part is used as the head 5 in the air, the boss one a1 and 1b1 by which combination with said screw thread 2 was provided into the head 5 of these hollow and the pedestal 4 are ****ed, and 2 is performing by concluding, as shown, for example in drawing 3.
[0018]As shown in drawing 1 and drawing 3, the intake 6 and the exit 7 of air are established in the right and left of the drum section of the device main frame 1, and these openings are equipped with the ventilation panels 8 and 9 which carried out die forming independently with the synthetic resin material. These ventilation panels 8 and 9 should have a coarse lattice eye of a square shape as shown in drawing

1 - drawing 8. Resistance is not given to the air to pass, a risk of fingers entering and moreover, touching a high pressure part can be prevented, and it enables it to prevent small wastepaper, the piece of resin, a resin product, a metal piece, metal goods, etc. entering, and becoming a fire and a cause of fault current. The concrete gestalt is free if these are satisfied. As a thing with the big width along the flow direction of air, the longitudinal shuttlecock of these ventilation panels 8 and 9 can take in what is called a louver type of rectification, and has exerted it on the air sent out.

[0019]As shown in drawing 1 and drawing 3, using the space where the cross section of the above-mentioned device main frame 1 is long in this embodiment to the major axis direction which the drum section which is an ellipse makes between the intake 6 of the air of the device main frame 1, and the exit 7, The electrifying means 11 which electrifies the dust in the taken-in air in prescribed polarity, for example, plus, and the adsorption electrode 12 which adsorbs the electrified dust with it and reverse polarity, for example, negative polarity, are built in, The dust in the air which enters from the intake 6 of the device main frame 1 and from which it escapes to the exit 7 is electrified in positive polarity by the electrifying means 11, Since the dust after this electrification is adsorbed by the negative polarity adsorption electrode 12 contrary to it and is removed out of said air, air from which it escapes to the exit 7 can be made into clean air. Since an anion occurs and it goes away with these clean air in the air simultaneously, living conditions good for ecology are brought about.

[0020]In this embodiment, further, as shown in drawing 1 and drawing 3, using long one to the major axis direction of the space in the drum section of said device main frame 1 between the electrifying means 11 and the adsorption electrode 12, The starting blow electrode 13 which makes the electrified dust shift to the adsorption electrode 12 side, and carries out a starting blow by negative polarity contrary to this is built in. By this, it will become the air purifier in this embodiment has an unnecessary motor which drives a fan and this, and easy [composition], lightweight [an air purifier], and cheap, there is no sound by a fan and a motor rotating, and operation is quiet. However, the ventilation panels 8 and 9 are expected what has a draft resistance small as much as possible.

[0021]The electrifying means 11 and the starting blow electrode 13 constitute the starting blow means 14, and are formed in the unit with which the one rectangular frame 15 made of a synthetic resin was equipped, and the device main frame 1 enables it to detach and attach them independently from others in this unit unit. The electrifying means 11 consists of the thin wire 11a to which high voltage voltage is impressed, and inverted-L-shaped stretches this in the intake 6 side portion of the rectangular frame 15. however, various set-up gestalten of the wire 11a can be boiled and designed. As shown in drawing 1 and drawing 3, the electrode plate part 16a is located in the medial-surface near position and middle position in the exit 7 side portion of the rectangular frame 15, and the starting blow electrode 13 is formed by the one metallic plate member 16 by which it was made for the cross direction of this to turn to an air passing direction so that it may become the wire 11a and a mutual position. however, these concrete composition may be designed by versatility unless the function as an air cleaner is spoiled, and it can make it possible to detach and attach the electrifying means 11 and the starting blow electrode 14 individually

[0022]The adsorption electrode 12 is made into the thing of the structure which between the bending spacer parts 18a in which many electrode plates 18 were formed at itself was insulated with the sheet 19 made of a synthetic resin, and has been arranged by metal parallel to the passing direction of air in the rectangular frame 17 made of a synthetic resin as shown in drawing 2 and drawing 3, It enables it to have detached and attached to the device main frame 1 by independent [this]. However, if the dust in the air which this also passes can be efficiently adsorbed certainly with reverse polarity, suitable, therefore various concrete composition can be taken.

[0023]Between the exit 7 and the adsorption electrode 12, the filter 21 using the activated carbon etc. which were fabricated in the shape of meshes of a net is formed, and it enables it to also have detached and attached this to the device main frame 1 independently. Therefore, each of the starting blow means 14 with these electrifying means 11 and the starting blow electrode 13, the adsorption electrode 12, and the filter 21 pulls out individually according to the dirt, It is used repeatedly, washing whole in the state where it dissociated from the power supply, and making it used for a long period of time, without an air purifier carrying out degradation can attain without each superfluous handling.

[0024]Although it is preferred to form a filter also in the intake 6 by the starting blow method by a fan, it is advantageous not to adopt a filter from the meaning which stops a draft resistance as much as possible by an electrostatic starting blow method like this embodiment. However, it is not restricted to this and a filter can also be adopted.

[0025]Like the air purifier of this embodiment, carry out a starting blow with an electrostatic method,

take in air without a fan from the intake 6, and cleaning processing is carried out, With the air cleaner of the type sent out from the exit 7, the pure air after processing especially, the flow of air -- **** -- although it is loose and ventilation panels do not become dirty further easily, when it is environment with much dust in the air or the manhour of use of an air purifier becomes long especially, dirt may produce the ventilation panels 8 provided in the intake 6 along which the air which has not carried out pure processing passes.

[0026]Although this is coped with, it enables it to have detached and attached the ventilation panels 8 provided in the intake 6 to the device main frame 1 in this embodiment. this can be kept clean and using an air cleaner for a until [life full] long period of time by demounting these ventilation panels 8 according to a soiled state, separating from a power supply and washing whole by this, can be continued well

[0027]Although the device main frame 1 detaches and attaches each of the starting blow means 14, the adsorption electrode 12, and the filter 21 independently, The detaching port 22 as shown in drawing 3 of a size which exposes ****** by the side of those whole surface outside to the rear side wall 1b which forms the side in which the intake 6 and the exit 7 are not formed, drawing 6, and drawing 8 is formed, The pocket member 23 formed of the combination of the simple substance which forms the pocket which accommodates these starting blow means 14, the adsorption electrode 12, and the filter 21 between this detaching port 22 and front wall 1a, or the adequate several synthetic resin member, It is put as shown in drawing 3 on behalf of a part, and fastening is carried out between said boss one a1 and one b1. The guide groove 24 for starting blow means 14 as shown in the bottom wall and ceiling wall of this pocket member 23 at drawing 1 and drawing 2, the guide groove 25 for adsorption electrode 12, and the guide groove 26 for filter 21, respectively, It enables it to have detached and attached individually from the detaching port 22 side along these each guide grooves 24-26.

[0028]Each of the starting blow means 14, the adsorption electrode 12, and the filter 21, By the difference between the width of the guide grooves 24-26 which it has width which is different as shown in drawing 1 - drawing 3, and height differs among the starting blow means 14 and the adsorption electrode 12, and the filter 21, and were provided according to them, and an up-and-down interval. Even if it cannot insert even if each of the starting blow means 14, the adsorption electrode 12, and the filter 21 tends to insert in an un-proper position, or it can insert, a backlash arises, and it turns out that it is un-proper wearing, and such incorrect wearing can be prevented from arising on use.

[0029]As shown in (a) of drawing 2 and drawing 9, the electrode 31 which is connected with the wire 11a of the electrifying means 11 on the undersurface of the rectangular frame 15 of the starting blow means 14, and impresses an electric charge to it is exposed, The electrode 32 which is connected with the starting blow electrode 13 at the upper surface, and impresses an electric charge to it is exposed, When the electric charge impression electrodes 33 and 34 by the side of the power supply projected as it is inserted in up-and-down both sides in the prescribed position of the up-and-down guide groove 24 and is shown there at (a) of drawing 2 and drawing 9 and (b) are contacted properly, The engaging recess 36 which carries out elastic engagement with the resin spring engagement piece 35 as shown in (a) of drawing 9 provided in the guide groove 24 of said upper and lower sides by carrying out integral moulding and (b), and is stopped is formed, and if the starting blow means 14 is stopped elastically in said insertion point, Resist this elastic stop power, it becomes impossible to take out, and what the starting blow means 14 is taken out carelessly, or a position gap is carried out from an appropriate position, and results in a malfunction or a dangerous state can be prevented.

[0030]As shown in drawing 2 and drawing 10, the electrode 37 which impresses the voltage connected to the electrode plate 18 to the upper and lower sides of the rectangular frame 17 of the adsorption electrode 12 is exposed, And when the electric charge impression electrode 38 by the side of the power supply which the rectangular frame 17 was inserted in the prescribed position of the up-and-down guide groove 25, and has been projected there is contacted properly, The engaging recess 41 which carries out elastic engagement with the resin spring engagement piece 39 provided in the guide groove 25 of said upper and lower sides by carrying out integral moulding, and is stopped is formed, and if the adsorption electrode 12 is stopped elastically in said insertion point, It becomes impossible to only take out resisting this elastic stop power, and what the adsorption electrode 12 is taken out carelessly, or a position gap is carried out from an appropriate position, and results in a malfunction or a dangerous state can be prevented.

[0031]The filter 21 is a position immediately before the position in which this was inserted by the guide groove 26 to the appropriate position, A slip off stop is carried out by the cover member 43 made of a synthetic resin which uses own elastic deformation for the engagement groove 42 as shown in drawing 2

provided in the field with a level difference so that it might be mostly set to an identical level from the guide groove 26 with the guide grooves 24 and 25, and inserted elastically the engagement piece 43a of the upper and lower ends in it, It enables it to have prevented unprepared removal and a position gap.
[0032]The filter 21 can be pulled out by carrying out elastic deformation of this cover member 43, and removing it.
[0033]The knobs 15a, 17a, and 43b for detaching operation are formed, respectively, by this embodiment, integral moulding of them is carried out to the outside surface which performs attachment and detachment of the rectangular frames 15 and 17 and the cover member 43, and they are provided in it.
[0034]The detaching port 22 is equipped so that the lid 51 made of a synthetic resin as shown in drawing 2 and drawing 3 can be detached and attached, and the starting blow means 14, the adsorption electrode 12, and the filter 21 can be detached and attached if needed by removing the lid 51. Two sides which carry out for relativity as this attachment-and-detachment structure is shown in drawing 2 in the case of this embodiment, The fixed engagement piece 51a provided upward [of the up-and-down neighborhood] serves as a method of outside on the other hand at a top chord by carrying out integral moulding in this embodiment, It is made to engage with the engagement hole 52 established in the top chord to which the detaching port 22 corresponds, enabling free extraction and insertion, And it has equipped so that it can detach and attach by making the engagement part 53 provided in the lower side where said detaching port 22 corresponds carry out elastic engagement of the movable engaging piece 51c energized in the resin spring part 51b as it was in the engagement position which it was provided in the lower side which is another side, and was moved towards the method of outside.
[0035]The work for which the whole lid 51 which the lid 51 fits the fixed engagement piece 51a over the engagement hole 52 of a top chord where the detaching port 22 corresponds, and is made engaged is moved to the plane direction by this, By the field and the work moved in the right-angled direction by the movable engaging piece 51c side, the lid 51 which makes the engagement part 53 provided in the lower side where said detaching port 22 corresponds carry out elastic engagement of the movable engaging piece 51c which turns to a way outside the lower side of another side which can be performed following this. A state can be equipped simply stop separating from the lid 51, and it can be considered as condition of use. The lid 51 is moved to a plane direction only by solving the elastic engagement to the engagement part 53 of said movable engaging piece 51c, the fixed engagement piece 51a is extracted from the engagement hole 52, engagement is solved, and the lid 51 can be removed simply.
[0036]The structure which detaches and attaches the ventilation panels 8 of said intake 6, The fixed engagement piece 8a provided in the lower side which is one side of two sides in which the ventilation panels 8 carry out for relativity as shown in drawing 1, drawing 2, and drawing 4 by carrying out integral moulding downward is a method of outside is made to engage with the engagement hole 61 established in the lower side where the opening of the intake 6 corresponds, enabling free extraction and insertion, And it is equipped so that it can detach and attach by making the engagement part 62 provided in the top chord to which said opening corresponds carry out elastic engagement of drawing 11 energized with the coil spring 63 as it was in the movable engagement position which it was provided in the top chord which is another side, and was moved downward which is a method of outside, and the movable engaging piece 64 as shown in drawing 12. The movable engaging piece 64 is exposed so that pressing operation of the press operation part 64a may be carried out to the upper surface of the ventilation panels 8. 64b shows the engagement piece for the slip off stops from the ventilation panels 8, and is engaging with the engagement hole 65 of the ventilation panels 8.
[0037]The work which moves the whole ventilation panels 8 which make the downward fixed engagement piece 8a of the lower side of two sides in which the ventilation panels 8 carry out for relativity insert and engage with the engagement hole 61 established in the lower side where the intake 6 corresponds to the plane direction, By the field and the work moved in the right-angled direction by the movable engaging piece 64 side, the ventilation panels 8 which make the engagement part 62 provided in the top chord to which the intake 6 corresponds carry out elastic engagement of the upward movable engaging piece 64 of the top chord of another side which can be performed following this. A state can be equipped simply stop separating from the ventilation panels 8, and it can be considered as condition of use. Move the ventilation panels 8 to a plane direction only by carrying out pressing operation of the elastic engagement to the engagement part 62 of said movable engaging piece 64, and solving the press operation part 64a, extract the fixed engagement piece 8a from the engagement hole 61, and engagement is solved, Since the ventilation panels 8 can be removed simply, it is convenient to carry out repeated use, washing the ventilation panels 8 whole.

[0038]It is in the state from which either the ventilation panels 8 or the lid 51 separated, or it is dangerous if an air purifier is used in the state where it was separating. As this embodiment shows to drawing 1 and drawing 2 coping with this, when the fixed engagement piece 8a which carried out integral moulding to it engages with the engagement hole 61 in the case of the ventilation panels 8, The switch 71 by the side of the device main frame 1 is pushed according to the metal surface of the projection 72, and if the projection 73 made of resin by which integral moulding was carried out when the movable engaging piece 64 engaged with the engagement part 62 is not satisfied with one side of the both sides which push the switch 74 by the side of the device main frame 1, the electric supply from a power supply is severed. If it does not satisfy that the projection 75 pushes the switch 76 by the side of the device main frame 1 when the movable engaging piece 51c which carried out integral moulding to it of the lid 51 engages with the engagement part 53, the electric supply from a power supply is severed. Therefore, since it does not operate unless it is correctly equipped with the ventilation panels 8 and the both sides of the lid 51 even if equipped with the starting blow means 14 and the adsorption electrode 12, the safety of use is ensured.
[0039]the ventilation panels 9 provided in the exit 7 in this embodiment also adopting the thing of the same shape as said ventilation panels 8 provided in the intake 6, and the same structure, and changing and inserting in the movable engaging piece 64 -- time -- ** -- the ventilation panels 9 are fixed using the fixed engagement piece 84. It is not necessary to form another ventilation panels 9 also for this forming the fixed ventilation panels 9, and a cost rise can be suppressed.
[0040]If you enable it to also detach and attach the ventilation panels 9 of the exit 7, this is also separated from a power supply, can be washed whole and is convenient. In this case, what is necessary is just to adopt the same attachment-and-detachment structure and safe structure as the ventilation panels 8. 81 shown in drawing 5 shows an electric power switch, 82 shows an operation light, 83 shows a check lamp, respectively, and check is urged to a check lamp at the time of the degradation by dirt etc.
[0041]
[Effect of the Invention]According to the air cleaner of this invention, in the thing of the type which takes in air with the above-mentioned fan and is sent out especially. Regardless of the type which carries out a starting blow with the electrostatic method by the composition of an invention of claim 3, It is carrying out the ventilation panels which have become dirty depending on the manhour of use and which are provided in the intake side at least, for example like the invention of claim 2, and enabling it to detach and attach them, this can be kept clean and using an air cleaner for a until [life full] long period of time, since it can separate from a power supply and can wash whole can be continued well
[0042]The work which moves the whole ventilation panels which make the fixed engagement piece which turns to a way in the invention of claim 2 outside [one / in which ventilation panels carry out for relativity] two sides insert and engage with the engagement hole established in the neighborhood whose intake and exit correspond to the plane direction, By the field and the work moved in the right-angled direction by the movable engaging piece side, the ventilation panels which make the engagement part provided in the neighborhood to which said opening is equivalent carry out elastic engagement of the movable engaging piece which turns to a way outside the neighborhood of another side which can be performed following this. Can equip a state simply stop separating from ventilation panels, can consider it as condition of use, and, Since ventilation panels are moved to a plane direction only by solving the elastic engagement to the engagement part of said movable engaging piece, a fixed engagement piece is extracted from an engagement hole, engagement is solved and ventilation panels can be removed simply, it is convenient to carry out repeated use, washing ventilation panels whole.
[0043]Since it can have an opening to which all these apparatus is exposed the side of a device main frame is parallel to the direction with which said each apparatus is located in a line, and uninfluential in existence with an intake and an exit, and the ventilation panels provided in them according to the invention of claim 4, Each apparatus in the required unit corresponding to the difference in the degree of dirt, etc. through such an opening. each time of necessity -- each -- superfluous in the fall of the performance can wash whole and equip in the state where took out individually and it separated from the power supply, and according to the dirt of these apparatus -- using an air cleaner for a long period of time is continued, dealing with it and preventing that there is nothing

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[Translation done.]

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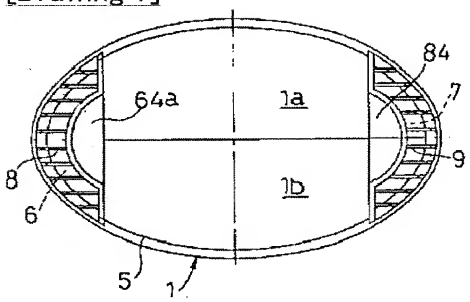
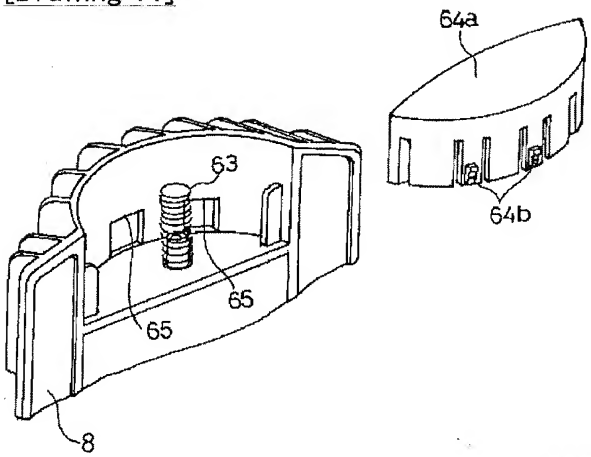
DRAWINGS

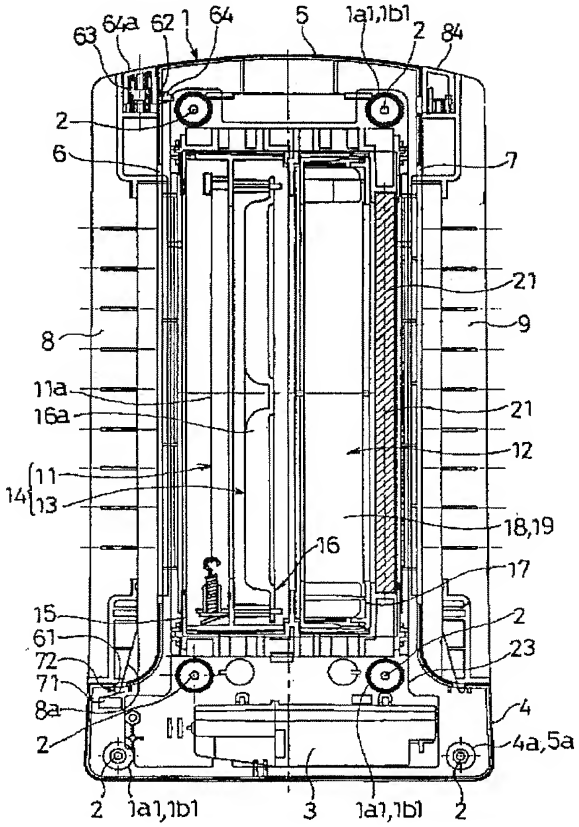
[Drawing 7]



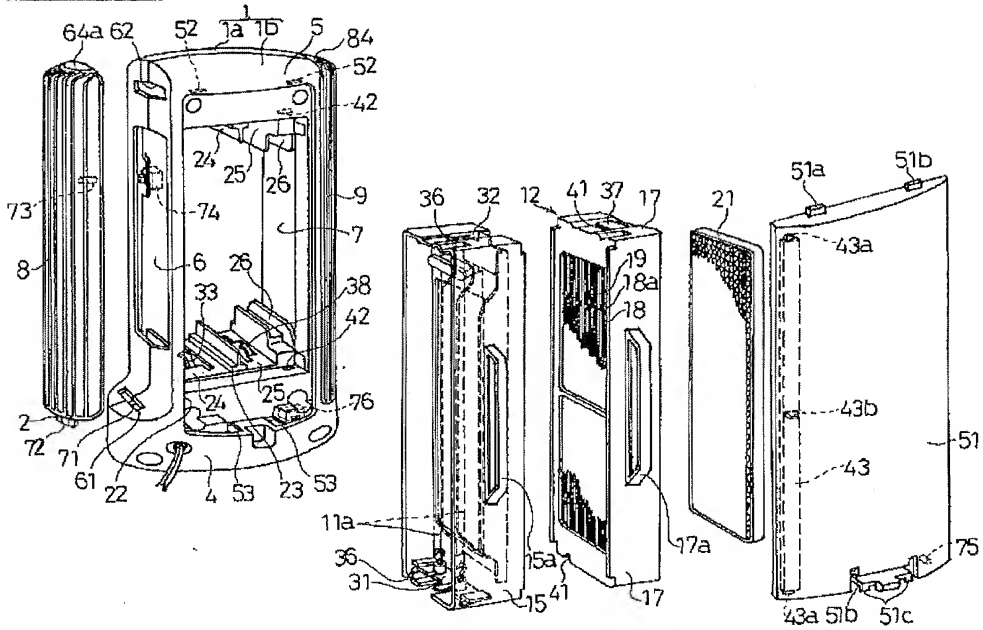
[Drawing 11]



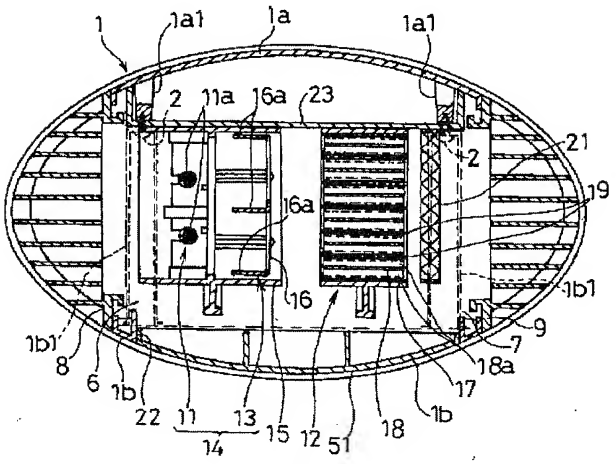
[Drawing 1]



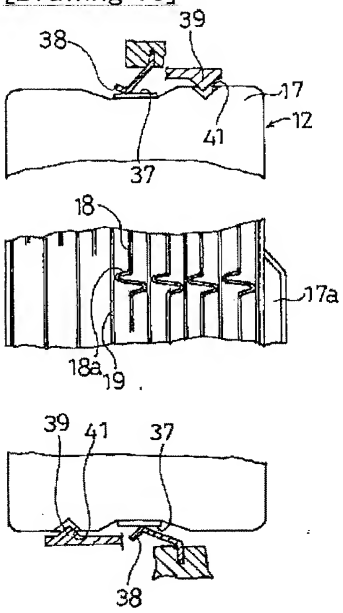
[Drawing 2]



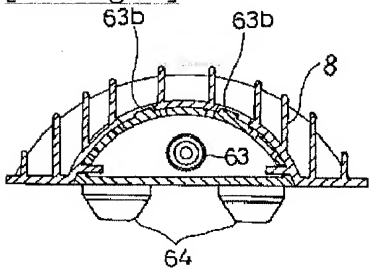
[Drawing 3]



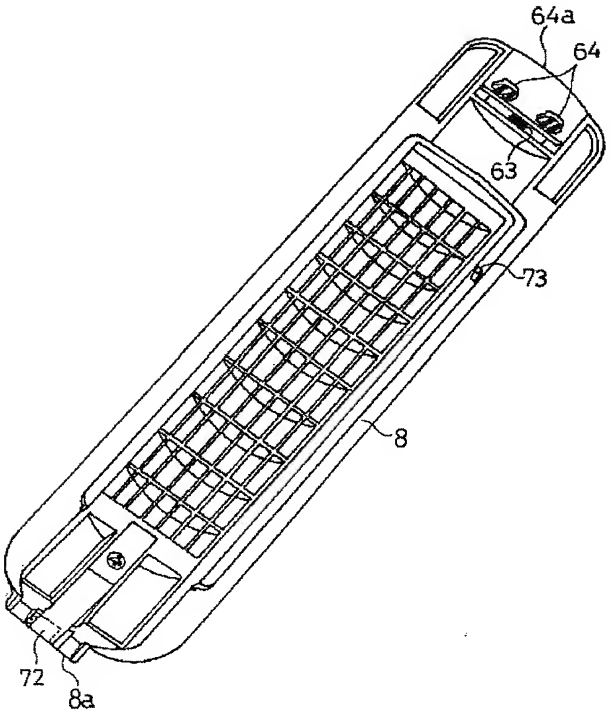
[Drawing 10]



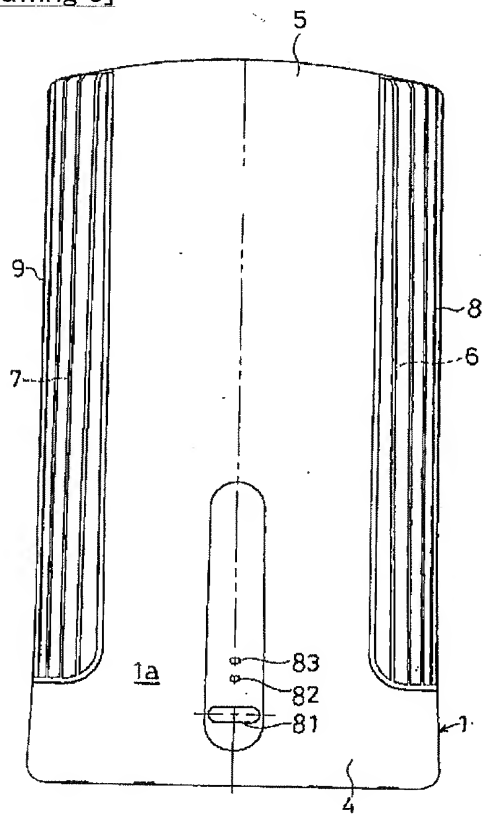
[Drawing 12]



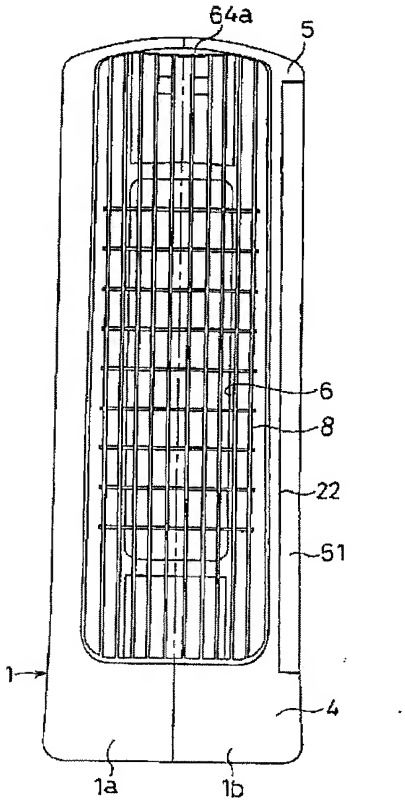
[Drawing 4]



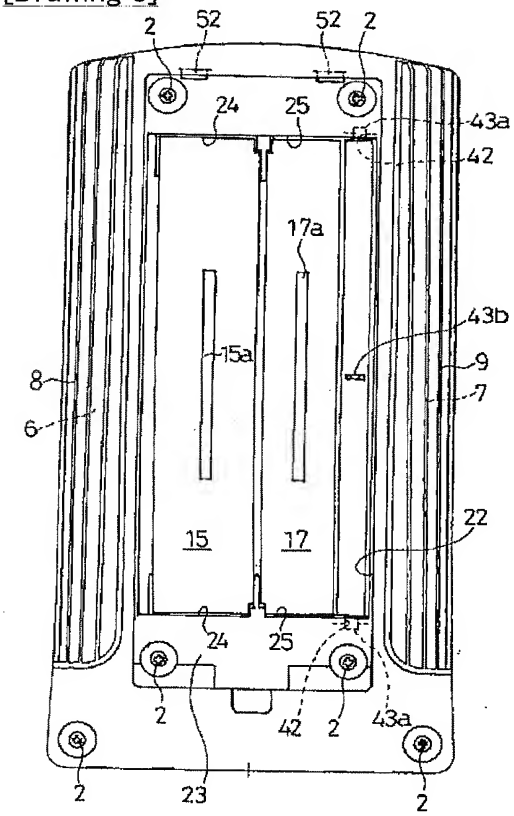
[Drawing 5]



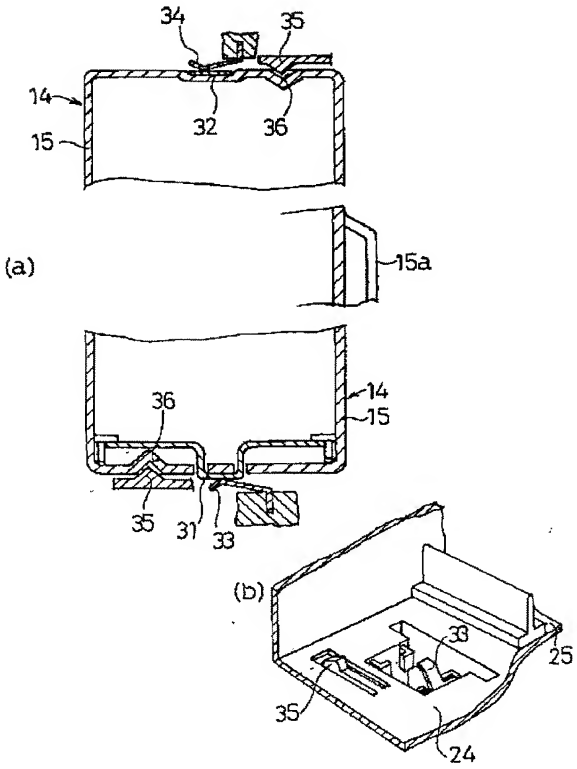
[Drawing 6]



[Drawing 8]



[Drawing 9]



[Translation done.]